

**Wyle Laboratories
Norco Facility
ENVIRON and Wyle's Response to DTSC's 6-23-05 Comments on the 6-10-05 Draft Presumptive Removal Action Workplan
for Soil Gas at The Northwest Area
Wyle Laboratories, Norco, California**

Item	DTSC Comment	ENVIRON and Wyle Response
6-23-05 AMIT PATHAK, P.E., Hazardous Substances Engineer Schools Unit - Cypress Office		
GENERAL COMMENTS:		
1.	<p>SVE (Soil Vapor Extraction) operation proposed in the RAW is contingent upon groundwater depth in the Northwest area. Since all of the SVE wells screens are planned below 10 ft. bgs, the groundwater depth has to recede to at least 15 ft. below ground surface (bgs) before the SVE can be operational. The drop in groundwater levels may take longer than expected in which case implementation of SVE system may be delayed.</p> <p>Since DTSC requires that the remedial action objective(s) stated in the RAW be achieved, SVE wells should be installed</p>	<p>As discussed during our May 20, 2005 meeting with DTSC, shallow ground water depth at the Northwest Area may indeed cause delays to implementation of SVE, DTSC's preferred remedial alternative. Technical limitations of SVE technology at the Northwest Area (including potential delays due to shallow ground water levels) were brought to the attention of DTSC prior to submittal of the Presumptive RAW. Despite these limitations, DTSC requested ENVIRON and Wyle to abandon the proposed chemical oxidation of TCE in ground water by permanganate injection (as presented in ENVIRON and Wyle's, <i>Draft Removal Action Workplan for Ground Water at the Northwest Area</i>, submitted to DTSC on March 1, 2005), in favor of SVE technology as presented in the Presumptive RAW.</p> <p>With that said, the maximum planned depth of SVE extraction wells is 10 feet, as stated on pages 28 and 29 of the Presumptive RAW. Historically, the depth to ground water in the Northwest Area was on the order of 12 to 15 feet below ground surface (bgs), sufficiently deep to allow operation of the planned SVE wells. In April, ground water levels had risen to approximately 4 to 5 feet bgs. Since that time, water levels have steadily declined and are now 6 to 7 feet bgs. Further decline is expected as the summer proceeds. Ultimately, barring another very wet winter, water levels should decline to a depth that will allow operation of the SVE system.</p> <p>As stated on pages 28 and 29 of the Presumptive RAW, Wyle intends to screen SVE wells from approximately 5 to 10 feet bgs to address</p>

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	<p>at shallower depth (less than proposed 15 feet) so that operations of the proposed SVE system can be expedited. As water levels recede, Wyle may propose to install additional deeper SVE wells in the future. For the shallow SVE wells, Wyle may evaluate shallow horizontal and/or vertical SVE wells.</p>	<p>VOCs in shallow soil gas at the Northwest Area and to minimize the possibility of shallow ground water levels hindering implementation of the proposed remedial action. Screen depths will be discussed further in the Operation and Maintenance (O&M) Plan for the proposed SVE system, to be prepared under separate cover per the schedule presented on Figure 6 of the Presumptive RAW (lines 10 and 11).</p> <p>Horizontal wells were considered but not selected because</p> <p>a) many more horizontal wells than vertical wells would have to be installed to achieve an equivalent radius of influence covered by the proposed vertical wells, b) due to the heterogeneous formation and changes in elevation in the bedrock surface, installation of long horizontal wells is more problematic (e.g., more prone to encountering refusal) than installation of vertical wells, c) due to the presence of subsurface utilities in proximity to each home, installation of long horizontal wells increases the probability of inadvertent utility damage when compared to vertical wells; and</p> <p>d) vapor extraction through long horizontal wells from approximately 5 to 7 feet bgs would have a higher possibility of short-circuiting to the surface due to installation under lawns and gardens than vertical wells installed under pavement (e.g., asphalt or concrete).</p>
2.	<p>The RAW should include contingency in case SVE system cannot be implemented because of high groundwater levels. The contingency may include modification/expansion of the proposed SVE and/or application of other technology. If SVE cannot be implemented, it may be necessary to conduct indoor air quality sampling in the homes to evaluate exposure from indoor air and the need for increased ventilation via HVAC system.</p>	<p>There are no remedial technologies that meet the remedial action objectives (RAOs) and address only soil gas, as discussed in Sections 4.0 and 5.1 of the Presumptive RAW. Wyle prepared a Draft RAW for mitigation of TCE in ground water, the recognized source of TCE in soil gas at the Northwest Area, which was submitted to DTSC on March 1, 2005. This Draft RAW proposed to, (1) reduce the concentration of VOCs in ground water through injection of permanganate, and (2) control vapor partitioning of VOCs from ground water and therefore reduce potential exposure via the indoor air</p>

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		<p>pathway. Wyle believes this is a viable alternative to the Presumptive RAW remedy. However, in a letter dated April 11, 2005 and during the May 20, 2005 meeting, DTSC rejected this remedy and expressed a preference for SVE technology; as a result, Wyle prepared the Presumptive RAW. If SVE cannot be implemented in the Northwest Area, Wyle will revert to its original proposal.</p> <p>As mentioned in Section 3.2 of the Presumptive RAW, Wyle conducted indoor air quality (IAQ) sampling in October of 2004 at the three residences located in proximity to the highest detected soil gas concentrations. The results of the IAQ sampling indicated vapor intrusion in only one home, which was mitigated through installation of a new HVAC system. In April of 2005, when water levels were at their highest recorded levels (4 to 5 feet bgs), Wyle repeated the IAQ sampling in the three homes. Sampling results indicated the absence of vapor intrusion in all three homes (the HVAC system at 2281 Golden West Lane proved effective in mitigating vapor intrusion). On June 6, 2005, DTSC informed the residents of the results of the IAQ sampling and stated "the levels detected do <u>not</u> pose a threat to human health, either immediate or long term." Based on these results, no additional IAQ sampling is deemed necessary at this time other than ongoing quarterly monitoring conducted at 2281 Golden West Lane.</p> <p>Note that the Presumptive RAW was prepared as an interim remedial measure (IRM) at the request of DTSC, not as a result of vapor intrusion.</p> <p>The Presumptive RAW includes the installation of six nested vapor probes, which will be monitored <u>in addition to</u> the existing five nested vapor probes during operation of the proposed SVE system (refer to Section 7.3.2). Additionally, prior to the implementation of the</p>

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		<p>Presumptive RAW, IAQ sampling will be performed in the three residences on Golden West Lane, simultaneously with vapor probe sampling (Figure 6, lines 25 and 26). Data generated during the monitoring events will be used to gauge system performance and evaluate the need for system modification or additional sampling (i.e., IAQ sampling). This will be discussed further in the O&M Plan for the proposed SVE system, to be prepared under separate cover per the schedule presented on Figure 6 of the Presumptive RAW.</p>
3.	<p>Wyle plans to install nine SVE (Soil Vapor Extraction) wells. However, design parameters such as radius of influence (ROI), flow versus applied vacuum data for optimizing the system are unknown.</p> <p>It is difficult to understand how the wells are configured in the absence of radius of influence information. The radius of influence data along with the flow versus applied vacuum data should be collected initially with one extraction well so that the SVE well network can be appropriately configured.</p>	<p>As mentioned in the response to Item 2 above and discussed in Section 7.3, the Presumptive RAW was prepared at the request of DTSC, and was intended as an IRM to reduce the potential for indoor air intrusion to residences at the southern terminus of Golden West Lane in the Northwest Area.</p> <p>The lack of information regarding the ROI was discussed during the May 20, 2005 meeting. At that time, the agency indicated it would forgo a pilot test in favor of expediting remediation implementation. Therefore, Wyle based the spatial orientation of wells on historic soil gas results. An estimated ROI of 30 feet was used. This estimate was considered reasonable based on professional experience and the nature of subsurface soils (alluvium and weathered granitic rock mass), as evidenced during recent and past subsurface investigations at the Northwest Area. Installing only one well, collecting this information and then remobilizing to install more extraction wells and piping will result in delays in implementation.</p> <p>SVE design was completed based on existing data and professional experience, which is consistent with DTSC's desire to expedite implementation of an IRM at the Northwest Area, and thus mitigate soil gas in an expeditious manner. See Section 7.3 of the Presumptive</p>

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		RAW. Additional SVE wells may be installed should post system operation monitoring demonstrate an ROI substantially smaller than the assumed 30 feet.
4.	The SVE wells installed will be 10 ft bgs (below ground surface). However, the geological formation below 10 ft bgs may consist of decomposed granite bedrock and competent granite bedrock that will have low air permeability limiting the effectiveness of the SVE. If possible, all the extraction wells should be placed in alluvial fan deposits instead of decomposed granite bedrock and competent granite bedrock to optimize the SVE.	<p>Based on recent and past subsurface activities at the Northwest Area, subsurface soils are known to consist of alluvium, colluvium, and decomposed in-place granitic mass (refer to Section 2.3). Based on field experience, it is not considered likely that competent granitic bedrock will be encountered during drilling of the nine SVE wells, which have an intended total depth of 10 feet bgs. In addition, given the thickness of alluvial deposits on Golden West Lane (approximately 5 feet or less), it will not be possible to install SVE extraction wells solely in alluvial materials.</p> <p>The O&M Plan for the proposed SVE system, to be prepared under separate cover per the schedule presented on Figure 6 of the Presumptive RAW (lines 11 and 12), will include details pertaining to SVE well installation, including contingency procedures for the potential encounter of decomposed or competent granitic bedrock.</p>
5.	<p>The RAW should elaborate on SVE design and should include:</p> <ul style="list-style-type: none"> • Process Flow Diagram (PFD) with sampling points; • Equipment Specifications for major components such as blower/vacuum pump, carbon adsorption vessels, etc. 	A PFD has been prepared for the proposed SVE system and is included as Figure 7 of the Presumptive RAW. The PFD is referenced, as appropriate, in Section 7.0 of the Presumptive RAW. The O&M Plan for the proposed SVE system, to be prepared under separate cover per the schedule presented on Figure 6 (lines 11 and 12) of the Presumptive RAW, will include equipment specifications for the major components, as requested by DTSC.

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6.	The RAW should include Operation and Maintenance (O&M) plan. The O&M plan should also include the procedure for regular continuous SVE operation, rebound measuring, SVE operation in pulse mode and SVE closure criteria.	Wyle completed a RAW addressing the central portion of the Site in May 2004, which currently is being implemented. During preparation and approval of the previous RAW, DTSC and Wyle agreed that an O&M Plan would be prepared under separate cover. When preparing this Presumptive RAW, Wyle followed this same, previously approved procedure, and included preparation of an O&M Plan according to the schedule presented on Figure 6 (lines 11 and 12). The O&M Plan will be prepared after the RAW is approved, during DTSC's CEQA process. The O&M Plan will include details regarding SVE system start-up, monitoring, and cessation.
7.	The RAW anticipates O&M (Operation and Maintenance) cost for one year only. However, the O&M duration depends on achieving cleanup goals and efficiency of the SVE system. The RAW should define the cleanup goal for each COC (chemical of concern). The O&M cost should be included at least for three years.	<p>As mentioned in the response to Items 2 and 3 above, the Presumptive RAW was prepared at the request of DTSC, and is intended as an IRM to reduce the potential for indoor air intrusion to residences at the southern terminus of Golden West Lane in the Northwest Area. As discussed during the May 20, 2005 meeting, the RAO (see page E-1 and Section 4.1, page 16) is to <u>reduce the potential</u> for indoor air intrusion, not to remediate COCs to specific levels. This will be addressed by comprehensive site-wide remediation to be implemented following further investigation activities at the Northwest Area and preparation of a comprehensive risk assessment, which will be used to establish remediation goals for all media and all COCs.</p> <p>Based on the current schedule for the RI (June 30, 2005), FS and RAP, site-wide remediation can be implemented toward the end of 2006, therefore, a 12-month operation schedule was considered reasonable. However, if necessary the SVE system can be operated for periods longer than 12 months. No changes to the O&M cost are required.</p>

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8.	The RAW O&M should also include frequent indoor air monitoring from the affected residences to verify the mitigation of the exposure risk.	As mentioned in the response to Item 2, based on IAQ sampling results for October 2004 and April 2005, no other IAQ sampling is planned nor is additional IAQ sampling deemed necessary at the Northwest Area at this time. However, as agreed during the May 20, 2005 meeting with DTSC, prior to start-up of the SVE, one round of IAQ along with vapor probe sampling will be conducted (Figure 6, lines 25 and 26). The Presumptive RAW was prepared as an IRM at the request of DTSC, not as a result of vapor intrusion.
SPECIFIC COMMENTS:		
1.	<u>Section 7.3.3.</u> : This section should clearly state how groundwater level fluctuations affect the installation/operation of the SVE system.	As discussed with DTSC during the May 20, 2005 meeting, prior to submittal of the Presumptive RAW, the depth to water will affect the start-up and performance of the SVE IRM requested by DTSC. At a minimum, it is anticipated that ground water levels will need to be approximately 12 feet bgs in order for removal action implementation. Wyle conducted gauging of monitoring wells during June 2005. Table 1 has been updated to include this information; text in Sections 2.3.4 and 7.3.3 have been updated accordingly. As indicated in the table, maximum ground water elevations were in April 2005 and has declined steadily since that time.
	The piping between the SVE wells and SVE system will be a standard 2" diameter PVC. The pipe diameter appears small. Please verify the pipe diameter for the system flow and vacuum requirement.	Based on professional experience, 2-inch diameter PVC piping will be sufficient for the SVE system design proposed in the Presumptive RAW.
2.	<u>Attachment D3</u> : Section 2.1 mentions SVE casing of 2-inch diameter. However, the Figure shows 4-inch diameter casing. Clarify the diameter of the well casing.	Comment noted. The Figure has been revised to reflect the text.

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6-23-05 RONALD OKUDA, R.G. Staff Geologist, Geological Services Unit-Cypress Office		
GENERAL COMMENTS:		
1.	As the groundwater table recedes, water will still be trapped in the soil interstitial pore spaces and an initial higher vacuum may be necessary to open up the porosity. Care should be taken not to create a short circuit of the vacuum to the surface atmosphere.	Comment noted. Care will be taken to avoid short-circuiting of the SVE system.
	Some of the proposed extraction well locations appear to be located under concrete driveways and other impermeable soil covers. The screen depth of probes in those locations could be shallower to avoid being installed in saturated soils. In those locations where there are no surface coverings, the work plan should address potential short-circuiting.	The amount of impermeable surface cover is considered small relative to the total surface area to be addressed by the proposed SVE system. Therefore, in order to minimize the potential for short-circuiting; the top of the SVE well screen will be no shallower than 5 feet bgs.
2.	If the residents are excessively watering their vegetation, especially around the house foundation, the water may fill the pore spaces in the soil, blocking airflow in the subsurface. This should be considered during design and placement of the soil vapor extraction probes.	Comment noted; however, excessive watering of vegetated cover is not considered a significant technical constraint to design of the SVE system. Furthermore, the majority of SVE extraction wells are located in areas not submitted to irrigation (e.g. below driveways, at or near property boundaries). In consideration of the large area to be treated by the SVE system, potential blockage of airflow due to saturated pore space due to watering is not considered a limiting factor.

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